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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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BEYER WEAVER & THOMAS LLP			SONG, SARAH U	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/621,035	Applicant(s) MAZOTTI ET AL.	
	Examiner Sarah Song	Art Unit 2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>0604,0404,0404</u> . | 6) <input type="checkbox"/> Other: ____. |

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DETAILED ACTION

Information Disclosure Statement

1. The prior art documents submitted by the applicant in the Information Disclosure Statement filed on June 4, 2004, April 16, 2004 and April 5, 2004 have all been considered and made of record (note the attached copy of form PTO-1449).

Specification

2. The disclosure is objected to because of the following informalities: in line 32 of page 10, change “photnic” to –photonic–.

Appropriate correction is required.

Claim Objections

3. Claim 1 is objected to because of the following informalities: in line 13 on page 16, Examiner suggests inserting –the—before “first”. Appropriate correction is required.

4. Claims 2 and 3 objected to because of the following informalities: “the flexible band of electronic transmission lines” lacks proper antecedent basis. Examiner suggests changing the limitation to –the flexible band containing a plurality of electrically conductive wires–.

Appropriate correction is required.

5. Claim 12 is objected to because of the following informalities: “the semiconductor package” lacks proper antecedent basis. Examiner suggests changing claim dependency to provide proper antecedent basis for the limitation. Appropriate correction is required.

6. Claim 25 is objected to because of the following informalities: in line 29 on page 19, Examiner suggests inserting –the—before “first”. Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. **Claims 1, 13-15, 17, 18 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Yang (U.S. Patent Application Publication 2003/0169980).**

9. Regarding claim 1, Yang discloses an opto-electronic module having an optical port and an electrical port comprising:

- a first substrate 14 having electrical traces (i.e. circuit of PCB), a port end, and an interior end;
- an opto-electronic device 15a attached to an electrically connected to the first substrate wherein the opto-electronic device serves as the optical port;
- a second substrate 8 having electrical traces (i.e. PCB), the second substrate having a port end and an interior end, wherein the port end forms the electrical port; and
- a flex connector 24 that is a flexible band containing a plurality of electrically conductive wires, wherein the flex connector connects the electrical traces within the first and the second substrates, whereby the flex connector allows for adjustable positioning of the height of the optical port with respect to the height of the electrical port. See Paragraph [0031].

10. Regarding claim 13, the first substrate 14 appears to be substantially rigid.

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11. Regarding claim 14, the second substrate 8 has a top surface and a bottom surface, and wherein the electrical port includes electrical contacts 22 on at least the bottom surface. See Figure 2.

12. Regarding claim 15, the first and second substrates are printed circuit boards. See Paragraphs [0029] and [0031].

13. Regarding claim 17, the second substrate appears to be substantially rigid.

14. Regarding claim 18, the first and second substrates appear to be substantially rigid.

15. Regarding claim 20, the module comprises a case 3 that contains the opto-electronic module wherein the case has an optical interface opening to provide access to the optical port and an electrical interface opening (bottom) to provide access to the electrical port.

16. **Claims 25 and 27 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee et al. (U.S. Patent 6,821,027).**

17. Regarding claim 25, Lee et al. discloses an opto-electronic module having an optical port and an electrical port comprising:

- a first substrate 146 having electrical traces 202, a port end, and an interior end;
- an opto-electronic device 124 attached to and electrically connected to the first substrate wherein the opto-electronic device serves as the optical port;
- a second substrate 166 having electrical traces (i.e. PCB), the second substrate having a port end and an interior end, wherein the port end forms the electrical port; and
- an intermediate substrate 148 containing a plurality of electrically conductive traces, wherein the intermediate substrate connects the electrical traces within the first and the

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second substrates, wherein a thickness of the intermediate substrate separates the height of the optical port with respect to the height of the electrical port by a desired distance.

18. Regarding claim 27, the intermediate substrate is sandwiched between the second substrate and the first substrate.

Claim Rejections - 35 USC § 103

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

20. **Claims 12, 16, 19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang.**

21. Regarding claim 12, Yang does not expressly disclose at least one electronic device attached to a surface of the first substrate wherein the electronic device is secured to a position that is directly adjacent to the semiconductor package. It is noted that at least one electronic device is a requisite feature of the opto-electronic device. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the electronic device on the surface of the first substrate directly adjacent to the semiconductor device package in order to provide a compact structure.

22. Regarding claim 16, Yang does not expressly disclose that the electrical and the optical ports face in opposite directions. See Figure 2. However, Yang discloses that the electrical contacts may extend laterally (end of Paragraph [0031]). Opto-electronic modules comprising the electrical and the optical ports face in opposite directions are well known in the art. Since the

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particular orientation of the electrical contacts is not a critical feature of Yang, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the electrical and the optical ports that face in opposite directions to conform with various from module standards of the art.

23. Regarding claim 19, Yang does not expressly disclose that the module is suitable for sending, receiving, or sending and receiving data signals at a rate of approximately 2.5 Giga bytes per second or greater. However, such modules are well known in the art. Therefore, it would have been obvious to one having ordinary skill in the art to provide a module operating at 2.5 Giga bytes per second in order to provide improved communication capabilities with the structural flexibility afforded by the flex connector of Yang.

24. Regarding claim 21, Yang does not expressly disclose that the flex connector is integrally formed with the first and second substrates. However, integrated flex connectors are well known in the art. IT would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an integral flex connector to provide ease of assembly.

25. **Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang as applied to claim 1 above, and further in view of Hargis et al. (U.S. Patent 6,792,171).**

26. Regarding claim 2, Yang does not expressly disclose that the flex connector is suitable for transmitting differential signals between the first and second substrate.

27. Hargis et al. discloses a flex connector 18 that is suitable for transmitting differential signals between a first and second substrate. See column 3, lines 47-55.

28. Yang and Hargis et al. are analogous art as pertaining to opto-electronic modules comprising flex connectors.

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29. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the flex connector 24 of Yang such that it is suitable for transmitting differential signals as taught by Hargis et al.

30. One of ordinary skill in the art would have been motivated to provide the flex connector that is suitable for transmitting differential signals in order to ensure signal quality.

31. Regarding claim 3, the electrically conductive wires of the flex connector is connected to the interior end of the second substrate and the interior end of the first substrate. See Figure 2.

32. **Claims 4-6 and 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang as applied to claim 1 above, and further in view of Nguyen et al. (U.S. Patent 6,707,140).**

33. Regarding claims 4 and 10, Yang does not expressly disclose the opto-electronic device to further comprise a semiconductor device package that includes a semiconductor die that is at least partially encapsulated within a protective molding material; electrical contacts formed on a top surface of the semiconductor die such that the contacts are exposed through a surface of the protective molding material; an optical device package that is mounted to the surface of the protective molding material such that the optical device package is electrically connected to the exposed electrical contacts.

34. Nguyen et al. discloses a semiconductor device package that includes a semiconductor die that is at least partially encapsulated within a protective molding material; electrical contacts formed on a top surface of the semiconductor die such that the contacts are exposed through a surface of the protective molding material; an optical device package that is mounted to the

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surface of the protective molding material such that the optical device package is electrically connected to the exposed electrical contacts. See Abstract.

35. Yang and Nguyen et al. are analogous art as pertaining to opto-electronic modules.

36. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the semiconductor device package including a semiconductor die encapsulated within a protective molding material, electrical contacts formed on a top surface of the die such that the contacts are exposed through the surface of the protective molding material, and the optical device package mounted to the surface of the protective molding material such that the optical device package is electrically connected to the exposed electrical contacts in order to provide a robust configuration.

37. Regarding claims 5 and 11, Yang discloses the optical device package comprising at least one photonic device 15 suitable for receiving or sending optical signals; and a support block 14c/14a to which the at least one photonic device is attached wherein the at least one photonic device is electrically connected to the exposed electrical contacts of the semiconductor package via electrical circuitry within or on the surface of the support block. See Paragraph [0029] lines 13-17.

38. Regarding claim 6, the photonic device 15 comprises more than one photonic device, wherein at least one is configured to receive optical signals and at least one is configured to send optical signals. See Paragraph [0009].

39. Regarding claim 8, it is noted that the opto-electronic device is attached along the port end of the first substrate 14b and the photonic device is mounted on a face of the support block that faces the port end of the first substrate.

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40. Regarding claim 9, the module further comprises a barrel unit 3 that is attached to the optical device package, the barrel unit having at least one hollow tube that provides optical access to the optical device package.

41. **Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yang in view of Nguyen et al. as applied to claim 5 above, and further in view of Hargis et al.**

42. Regarding claim 7, Yang does not expressly disclose an electrical converter for transmitting differential signals.

43. Hargis et al. discloses an electrical converter 12 transmitting differential signals between a first and second substrate. See column 3, lines 35-55.

44. Yang and Hargis et al. are analogous art as pertaining to opto-electronic modules.

45. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the electrical converter for transmitting differential signals as taught by Hargis et al.

46. One of ordinary skill in the art would have been motivated to provide the electrical converter for transmitting differential signals in order to ensure signal quality.

47. Furthermore, it would have been obvious to locate the electrical converter within or on the surface of the support block in order to provide the converter proximate the photonic device.

48. **Claims 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lytel et al. (U.S. Patent 6,619,858).**

49. Regarding claim 22, Lytel et al. discloses two parallel substrates 112, each substrate having an inside surface wherein the inside surfaces face each other; an opto-electronic unit 202 or 204 attached to each of the inside surfaces of the substrates. Lytel et al. further discloses that

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one of the units includes a first circuit board 220 that is attached to the inside surface of one of the substrates 112; a second circuit board 210 that is positioned substantially coplanar to and adjacent to the first circuit board 220; a flexible band of electrical transmission lines 318 that connect and provide electrical communication between the first and the second circuit board; an optical device 222 or 316 that is directly or indirectly attached to a surface of the second circuit board; wherein the optical device of each opto-electronic unit face each other such that optical signals can be transmitted between each of the optical devices.

50. Lytel et al. does not expressly disclose the second unit to be identical to the first unit.

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the second unit in the same manner as the first unit since it has been held that mere duplication of working parts requires routine skill in the art. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the second unit in the same manner as the first unit in order to provide greater degree of movement between the units to increase the space made available to technicians.

51. Regarding claim 23, Lytel et al. discloses optical guides 224, but does not expressly disclose an optical fiber. Optical fibers are well known in the art. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide optical fiber as optical guides since applicant has not disclosed that the feature solves any stated problem or is for any particular purpose, and it appears that the invention would perform equally well with any type of optical guide.

52. Regarding claim 24, Lytel et al. discloses a back plane 114 to support both of the substrates.

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53. **Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. as applied to claim 25 above, and further in view of Hargis et al.**

54. Regarding claim 26, Lee et al. does not expressly disclose that the intermediate substrate is suitable for transmitting differential signals between the first and second substrate.

55. Hargis et al. discloses a flex connector 18 that is suitable for transmitting differential signals between a first and second substrate. See column 3, lines 47-55.

56. Yang and Hargis et al. are analogous art as pertaining to opto-electronic modules comprising flex connectors.

57. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the electrical connector of Lee et al. such that it is suitable for transmitting differential signals as taught by Hargis et al.

58. One of ordinary skill in the art would have been motivated to provide the flex connector that is suitable for transmitting differential signals in order to ensure signal quality.

Conclusion

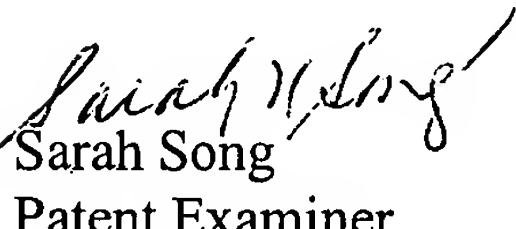
59. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sarah Song whose telephone number is 571-272-2359. The examiner can normally be reached on M-Th 7:30am - 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on 571-272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Sarah Song
Patent Examiner
Group Art Unit 2874